AR-250DR

DIRECT RECORD/REPRODUCE AMPLIFIER

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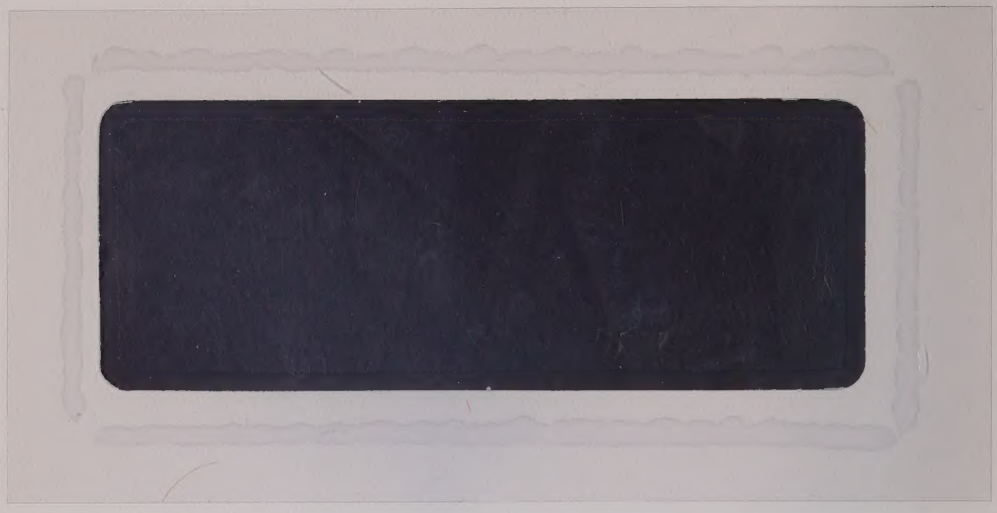

TEAC®

AR-250DR

DIRECT RECORD/REPRODUCE AMPLIFIER

APPLICABLE MODELS:
XR-5000/7000 SERIES ANALOG DATA RECORDER

INSTRUCTIONS
SERVICE MANUAL

TEAC CORPORATION, JAPAN P/N 10111317-00

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1. GENERAL

The AR-250DR is a DR (direct record/reproduce) amplifier which applies to the *XR-5000/7000 series analog data recorder. When the frequency components included in data to be recorded or analyzed for waveform range over a wider band, the frequency band covered by the FM record/reproduce method is not enough to record or reproduce those high-band components. In such a case, the AR-250DR is suitable for use in place of the FM record/reproduce amplifier with which the data recorder main unit is equipped standardly.

The DR record/reproduce amplifier covers a wider band than any FM amplifier, and is suited to the recording and reproduction of high-band components. No DC component can be recorded or reproduced as data at any rate.

NOTE: * XR-5000/7000 analog data recorder is hereinafter called main unit.

2. FEATURES

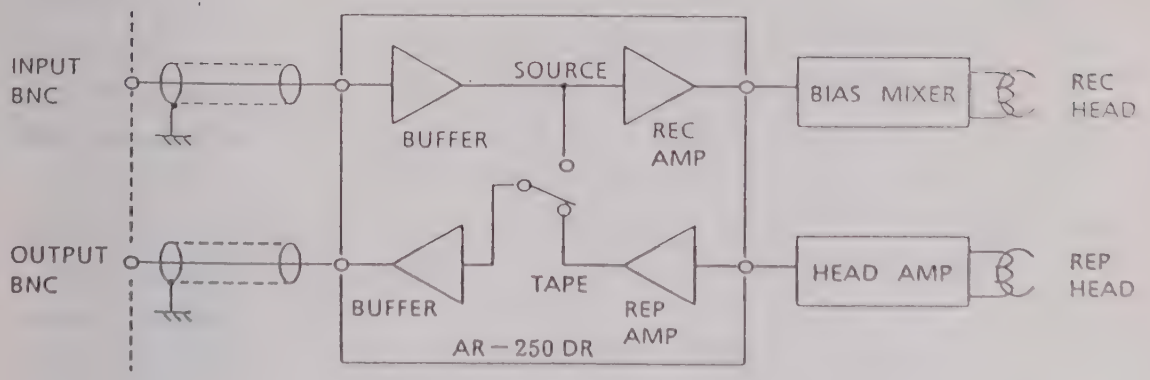
- The AR-250DR is easy to use by replacing with the FM record/reproduce amplifier mounted standardly on the XR-5000/7000 series analog data recorder.

- The functions of AR-250DR can be controlled concentratedly from the data recorder main unit.

- The AR-250DR is small, light, and easy to handle.

- The AR-250DR has minimized phase shifts at high-band frequencies at every tape speed and improved the fidelity of reproduced data by remodeling the conventional reproduce equalizer circuit.

3. CONFIGURATION (BLOCK DIAGRAM)



Remarks: - The reproduce amplifier has a built-in band-pass filter which is used to select the pass band of reproduced signals according to tape speed.

- The gain of the input amplifier (BUFFER) is selected according to the input range.

- The gain of output amplifier (BUFFER) is selected according to the output range.

4. SPECIFICATIONS AND RATING

Recording system: DR system (bias frequency: 2.4 MHz)

Tape used: Video Cassette T-120HGX GOLD Maxell

Input resistance: 100 kΩ ±10% (unbalanced)

Input capacitance: 100 pF or less

Input range: ±0.1, 0.2, 0.3, 0.5, 0.7, 1.0, 1.4, 2.0, 3.0, 5.0, 7.0, 10, 14, and 20 Vp

Input voltage: Up to 180% with each input range

Maximum input: 50 Vp

Output impedance: 75 Ω ±10% (unbalanced)

Output range: ±0.1, 0.2, 0.5, 1.0, 1.4, 2.0, 3.0, and 5.0 Vp

Overall characteristic (recording and reproduction)

Tape speed (cm/s)	Frequency response (±3 dB)	S/N dB
76.2	200 Hz - 150 kHz	32 dB
38.1	100 Hz - 75 kHz	32 dB
19.05	100 Hz - 37.5 kHz	32 dB
9.52	100 Hz - 18.75 kHz	30 dB
4.76	100 Hz - 9.38 kHz	30 dB
2.38	100 Hz - 4.69 kHz	28 dB
1.19	100 Hz - 2.34 kHz	26 dB

Distortion: 1%
The recording level is adjusted so that the third harmonics distortion at reproduction can fall into 1% when data is recorded under the condition of 100% input (15 kHz sine wave) at a tape speed of 76 cm/s in conformity to IRIG.

Output current: 5 mA (for 600 Ω load)

Current consumption: ±10 V (10 mA); ±6 V (40 mA); +5 V (5 mA)

Operating temperature and humidity: 0°C to +40°C; 20% to 80%

External dimensions and weight: 130.5 mm high × 147 mm long × 12 mm thick; 150 g

Miscellaneous: External ID record and reproduction function available (manual changeover switches S1 and S2)

5. HANDLING METHOD

5-1 Replacement with FM Record/Reproduce Amplifier

1. Disconnect the power cord from the power supply for the main unit, after confirming that the power switch on the data recorder main unit is set to POWER OFF.

2. Pull up outwards the stoppers (at two locations) fixing the rear panel with fingers. (Refer to instruction manual for the main unit.)

3. Open the rear panel downwards. (The FM record/reproduce amplifiers are inserted just inside the rear panel of the main unit in the order of channels.)

4. Draw out the FM record/reproduce amplifier to be replaced from the corresponding channel in the main unit. The connector can be easily drawn out with fingers forwards by pushing down the upper part of the card plow attached to the lower part of each board.

5. Insert a DR record/reproduce amplifier (AR-250DR) along the upper and lower rails in place of the FM record/reproduce amplifier. Do not insert the AR-250DR by excessive force with it derailed, or the connector and other parts might be damaged.

   Also, do not mistake the right side of the board for the reverse side.

6. Insert the connector by reversing procedure 4. Surely fit the connector by thrusting the amplifier once again to check for poor contact with the connector.

7. Fix the rear panel by reversing procedure 3.

Notes: - Replacement of an AR-250DR should be done through a specified channel.

- When an AR-250DR amplifier is used for external ID recording, set manual switches S1 and S2 in the AR-250DR amplifier to the 1 side. If the AR-250DR is to be used as a common data channel, set switches S1 and S2 to side 2.

  (The AR-250DR is factory-set to side 2 (data side).)

  Do not reproduce data with switches S1 and S2 set to side 1 (ID side), or an waveform different from input data might appear.

5-2 Operation Check

1. Connect the power cord to the main unit power unit and turn on the power supply. Then confirm through the multi-display that the channel in which an AR-250DR was mounted has changed from FM mode to DR mode. Confirm also that the other displayed entries have been initialized properly.

   If "DR" is not displayed for an AR-250DR mounted channel, or a display is imperfect, or nothing is displayed at all, then push the SYSTEM RESET switch on the rear panel of the data recorder main unit once. If the display still does not recover, then reset the power switch at once and confirm that the AR-250DR is inserted normally.

   If a display is imperfect although the AR-250DR is connected completely to the main unit, then reset the power switch, disconnect the power cord, and contact our company.

2. Activate the SELF TEST function after the confirmation of the entries on the multi-display, and perform a performance check on the main unit.

3. Perform several function checks for input and output range switching in the light of the instruction manual for the main unit after the above function check by SELF TEST.

* The above performance checks 1 to 3 are intended to confirm that the AR-250DR is mounted correctly in the main unit and free from any electrical faults, such as poor contact.

6. PRECAUTIONS

- Do not give an excessive impact to the AR-250DR. When it is not used, put it in a specified conductive bag and preserve the bag in the attached, corrugated cardboard case. (This also applies to the FM record/reproduce amplifier).

- Absolutely do not insert an AR-250DR in any other place than the specified ones, or in a machine other than the XR-5000/7000 series analog data recorders supplied by our company. Such an act may lead not only to a failure, but also to almost unrecoverable, not repairable damage on the performance and functions. The same also applies to the FM record/reproduce amplifier.

- If the AR-250DR is used with a channel other than the specified one, it may not satisfy the specifications, though it just functions. Pay special attention to this point on the occasion of replacement with an FM record/reproduce amplifier. (Readjustments are necessary whenever another channel is selected.)

- For the DR (direct recording) system, the high-band characteristic and distortion rate at reproduction may depend on the type of tape used in recording data. The AR-250DR has adopted video tape Maxell T-120 HGX GOLD as tape for adjustment in the factory. Accordingly, it is recommended to use a tape of the same type.

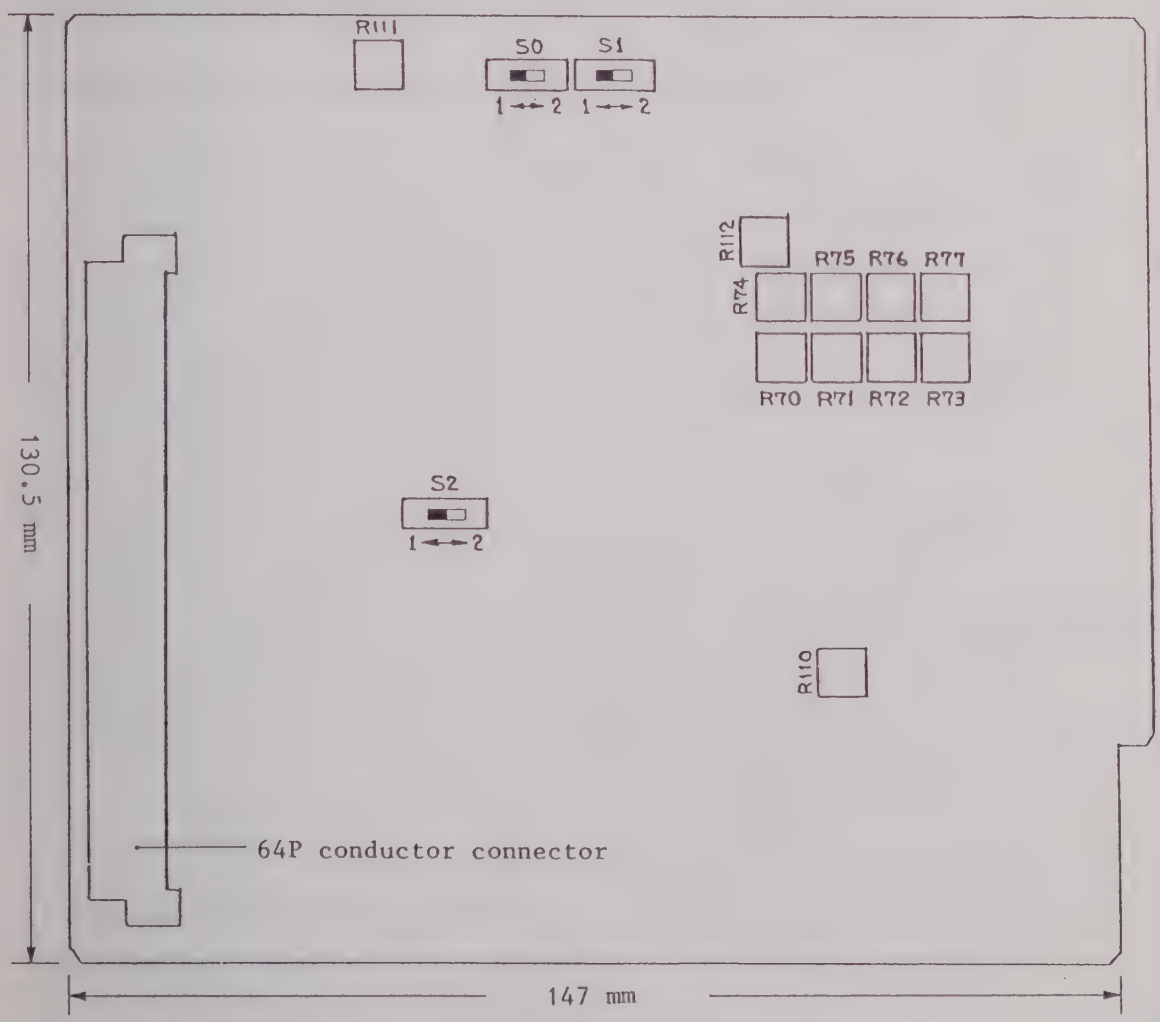
- The potentiometers attached on the AR-250DR board are important components that determine reproduce waveforms and level precision. Pay attention so as not to exert an impact or force on the rotatory parts in handling the potentiometers. (The same also applies to the FM record/reproduce amplifier.)

7. ADJUSTMENT SPECIFICATION

7-1 Scope

This Specification applies to the adjustment of the DR amplifier (AR-250DR) PCBA (Part No. 15552686-00) for the analog data recorder series XR-5000/7000.

7-2 External View and Locations of Adjusting Points



R110	REP ADJ 0 (Output level fine adjuster)	R71	1.2 cm/s reproduce equalizer adjuster
R111	REC ADJ (Recording level adjuster)	R72	2.4 cm/s reproduce equalizer adjuster
R112	REP ADJ 1 (Reproducing level adjuster)	R73	4.8 cm/s reproduce equalizer adjuster
S1	ID (1) ↔ DATA (2) switch	R74	9.5 cm/s reproduce equalizer adjuster
S2	ID (1) ↔ DATA (2) switch	R75	19 cm/s reproduce equalizer adjuster
S0	FAST reproduce OFF (1) ↔ ON (2) switch	R76	38 cm/s reproduce equalizer adjuster
R70	Not adjustment	R77	76 cm/s reproduce equalizer adjuster

7-3 Required Equipment

- DMM (Digital multi-meter)
- Oscillator (Frequency range: 100 Hz to 300 kHz;
  Distortion: 0.1% or less)
- AC level meter (HP 400E or equivalent)
- Third harmonic meter (45 kHz bandpass filter or spectrum analyzer)
- Oscilloscope (for confirmation; dispensable for adjustment)
- Frequency counter (for confirmation; dispensable for adjustment)
- Extension card (for adjustment only), Part No. 13352648-00
- BNC cable (for input/output), 2 or more

7-4 Precautions to be Observed Before, During, and After Adjustment

- Set switches S1 and S2 in the AR-250DR to position 1 (ID) only when checking the ID function, or to position 2 (data) in all other cases.
- Use the extension card only when adjusting the AR-250DR or when it developed trouble. Do not use it for evaluation tests.
- Before adjusting the AR-250DR, be sure to adjust the bias current (for the channel to be used with the AR-250DR) in the data recorder. See the table below.

Item	Specifications	Check point/ adjuster	Measuring conditions
⓪ Bias adjustment	Overbias -3 dB ±0.2 dB	BNC OUT Bias mixer R701 to R722 (Channel accommodated)	Simultaneously record and reproduce at 76 cm/s. Input = 2 Vp-p (150 kHz sine wave) Adjust R111 until waveform at TP2 is 1 Vp-p ±5%.

* Adjusters R701 (CH 1) to R721 (CH 21) are located on BIAS MIXER PCBA in the data recorder.

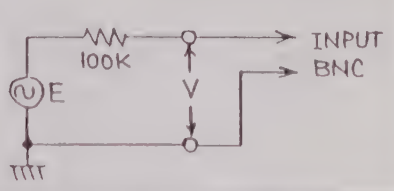
7-5 DR Amplifier Adjustment

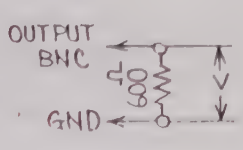
Item	Specifications	Check point/ adjuster	Measuring conditions
Ⓐ REP ADJ 0	0.707 Vrms ±0.1%	BNC OUT R110 (REP ADJ 0)	Amplifier to amplifier Tape speed = 76 cm/s CAL OFF Input range = 1 V Out range = 1 V Input = 0.707 Vrms (10 kHz sine wave)
Ⓑ REC ADJ	Third harmonic wave 0.9 ±0.05%	BNC OUT R111 (REC ADJ)	Simultaneously record and reproduce. Turn R77 to center position. Turn R112 fully counter-clockwise. Input = 0.707 Vrms (15 kHz sine wave) The rest is the same as above.
Ⓒ REP ADJ 1	0 ±0.1 dBm	BNC OUT R112 (REP ADJ 1)	Simultaneously record and reproduce. Tape speed = 19 cm/s Turn R75 to center position. Input = 0 dBm (3.75 kHz sine wave) The rest is the same as above.
Ⓓ Reproducing EQ high-range adjustment	±1 dB or less (target: ±0.5 dB) at each speed and 1/10 fc to fc	BNC OUT R71(1.2 cm/s) R72(2.4 cm/s) R73(4.8 cm/s) R74(9.5 cm/s) R75 (19 cm/s) R76 (38 cm/s) R77 (76 cm/s)	Simultaneously record and reproduce. Tape speed = 1.2 to 76 cm/s Input = 0 dBm Reference frequency = 1/10 fc (0 dB) Adjust the response to be as flat as possible at frequency 1/10 fc to fc. The rest is the same as above.

* The catalog specifications of the frequency response at each tape speed are as follows:

76 cm/s	200 to 150 kHz	±3 dB	fc = 150 kHz
38 cm/s	100 to 75 kHz	±3 dB	fc = 75 kHz
19 cm/s	100 to 37.5 kHz	±3 dB	fc = 37.5 kHz
9.5 cm/s	100 to 18.75 kHz	±3 dB	fc = 18.75 kHz
4.8 cm/s	100 to 9.38 kHz	±3 dB	fc = 9.38 kHz
2.4 cm/s	100 to 4.69 kHz	±3 dB	fc = 4.69 kHz
1.2 cm/s	100 to 2.34 kHz	±3 dB	fc = 2.34 kHz

7-6 DR Amplifier Specifications (Amplifier to Amplifier)

Item	Specifications	Check point/ adjuster	Measuring conditions
① Input resistance (kΩ)	100 k ±10%	Input BNC $R = \frac{100 \cdot V}{E-V}$ (kΩ) V may be measured at output BNC, provided that amplifier to amplifier output range is 1 Vp.	By resistance substitution method Input range = 1 Vp E = 1.00 Vrms (1 kHz sine wave) 
② Input capacity (pF)	100 pF or less	Output BNC Check frequency response that fc > 16 kHz at cutoff frequency of -3 kB.	Input range = 1 Vp Output range = 1 Vp Tape speed = 76 cm/s Using the same circuit as in Item ①, check the frequency response and confirm the high-range cutoff (-3 dB) frequency. Amplifier-to-amplifier (100 kohm resistor to be just before BNC IN)
③ Input range accuracy	±1%	Output BNC	Input range = 0.1 to 20 Vp Input = 100% of each input range (10 kHz sine wave) The rest is the same as above.
④ Output range accuracy	±1%	Output BNC	Input range = 1 Vp Output range = 0.1 to 0.5 Vp Input = 0.707 Vrms (10 kHz sine wave) The rest is the same as above.

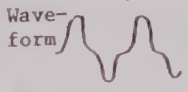
Item	Specifi-cations	Check point/ adjuster	Measuring conditions
⑤ Output impedance	75 Ω ±10%	Output BNC $R = (\frac{E}{V} - 1) \cdot 600\ (\Omega)$ E = 0.707 Vrms	Output range = 1 Vp  600 ohms ±1% load (560 ohms permissible) The rest is the same as above.
⑥ Output current	5 mA or more	Output BNC Check that waveform is not clipped.	Output range = 5 Vp Input range = 1 Vp Tape speed = 76 cm/s Amplifier to amplifier Input = 2 Vp-p (160 kHz sine wave) Output load 600 ohms (560 ohms permissible)
⑦ Input voltage	50 Vp	Input BNC	As desired

7-7 DR Amplifier Specifications (Simultaneous Recording and Reproducing)

Item	Specifications	Check point/ adjuster	Measuring conditions
⑧ Distortion	0.85 to 0.95%; third harmonic wave	BNC OUT	Input range = 1 Vp Output range = 1 Vp Tape speed = 76 cm/s Input = 0.707 Vrms (15 kHz sine wave) Simultaneously record and reproduce.
⑨ Frequency response	±2 dB or less at 100 Hz to 1/10 fc (150 Hz) ±1 dB or less at 1/10 fc to fc (Figures in parentheses apply where speed is 76 cm/s.)	BNC OUT	Tape speed = 1.2 to 76 cm/s Input = 0.707 Vrms (100 to fc Hz sine wave) Simultaneously record and reproduce. Also amplifier-to-amplifier Response output level at 1/10 fc as reference (0 dB) Amplifier-to-amplifier for confirmation only
⑩ Reproduce level accuracy (I)	±1 dB or less	BNC OUT	Tape speed = 1.2 to 76 cm/s Input = 0.707 Vrms (1/10 fc sine wave) Simultaneously record and reproduce. Response output level at tape speed of 19 cm/s as reference.
⑪ Reproduce level accuracy (II)	±1 dB or less	BNC OUT	Input = 0 dBm (3.75 kHz sine wave) After recording at tape speed of 19 cm/s, reproduce it at different tape speeds and measure its levels.

Item	Specifications	Check point/ adjuster	Measuring conditions
(12) Signal-to-Noise Ratio	Tape speed S/N 76 cm/s 33 dB 38 cm/s 33 dB 19 cm/s 32 dB 9.5 cm/s 32 dB 4.8 cm/s 31 dB 2.4 cm/s 30 dB 1.2 cm/s 29 dB	BNC OUT	Input = GND Tape speed = 1.2 to 76 cm/s Simultaneously record and reproduce.
(13) Temperature test 0°C to +40°C	0 dBm +3 dB Other functions shall be free of abnormalities.	BNC OUT	Tape speed = 76 cm/s Input = 0 dBm (fc sine wave) Simultaneously record and reproduce. fc = 150 kHz

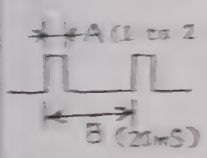
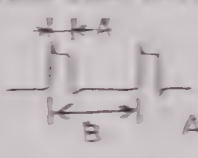
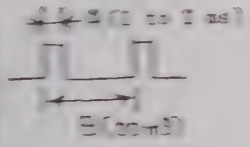
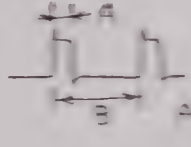
7-8 DR Amplifier Specifications (Overall for Data Recorder)

Item	Specifications	Check point/ adjuster	Measuring conditions
⑭ ID function	Shall be recordable and reproducible. Shall be reproducible at all tape speeds.	Output BNC Wave-form 	Tape speed = 76 cm/s Input BNC = 60 kHz, 2 Vp-p Input waveform
⑮ Crosstalk I	S/N shall be as specified (Said channel)	Output BNC (Said channel)	Input BNC = 0 V (shorted) Tape speed = 76 cm/s FM wide band (Data recorder) Simultaneously record and reproduce 20 kHz, 100% (FM) or 100 to 150 kHz, 100% (DR) on other channels.
⑯ Crosstalk II	S/N shall be as specified (Other channels) Shall be free of degradation.	Output BNC (Other channel)	Input BNC = 0 V (Other channels) Simultaneously record and reproduce 100 to 150 kHz, 100% on said channel. The rest is the same as above.

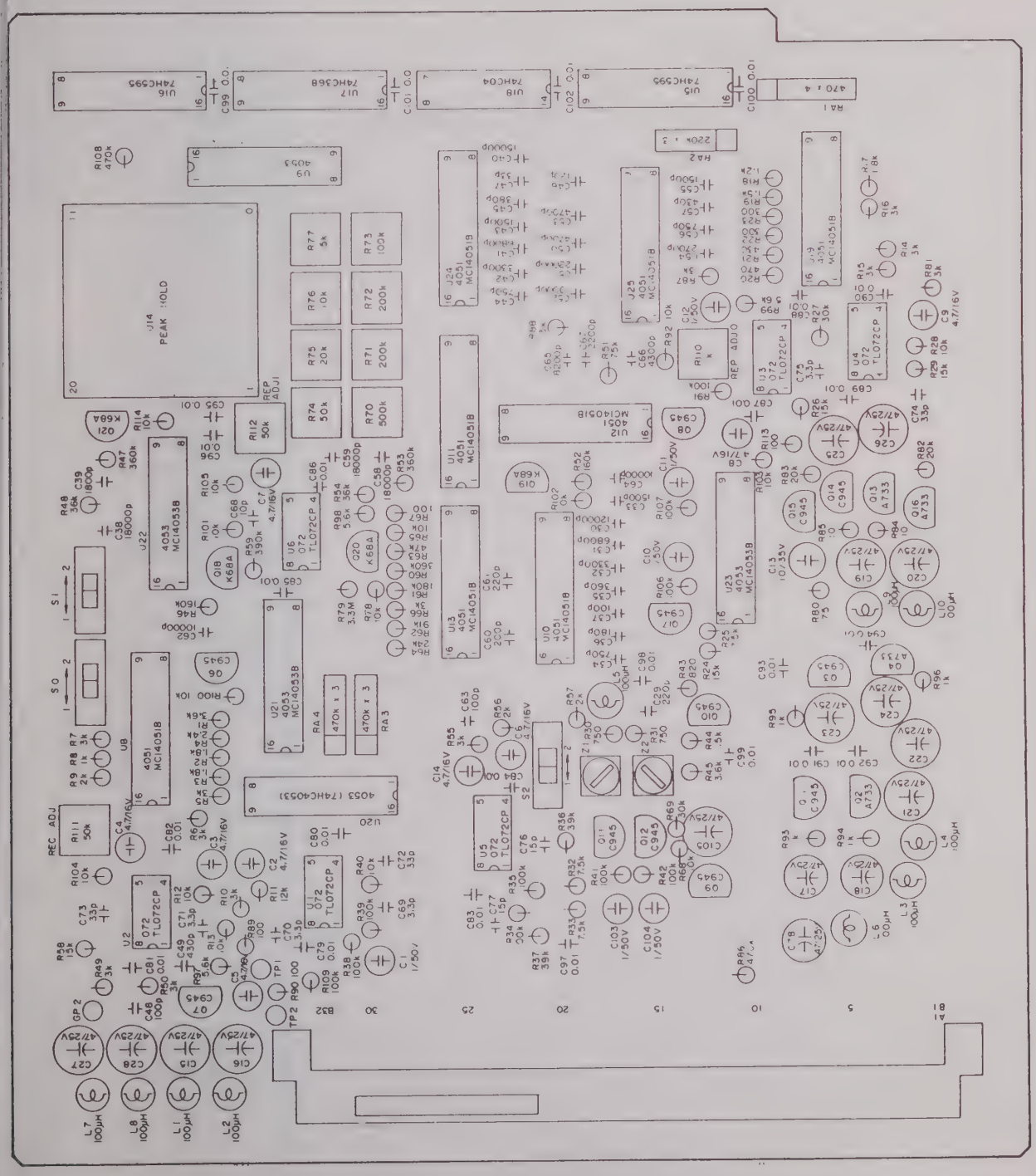
Precautions

1. If there is only one signal source (oscillator) in measuring crosstalk I (Item ⑮), simultaneously record and reproduce on the FM and DR channels separately, and check that both meet the specifications.
2. If it is difficult to simultaneously record on all the other channels in measuring crosstalk I (Item ⑮) due to input cable shortage, for example, record separately and check that the worst S/N of the recorded meets the specifications. (Enter the worst data value.)
3. In measuring crosstalk II (Item ⑯), enter the data on the channel that has shown the worst S/N degradation. If little difference is noted, enter the data on the channel that has shown the worst S/N.

4. In Items 20 and 21, enter the worst data value and judge acceptability. (The worst value refers to the S/N ratio for the measuring channel at which crosstalk is largest.)
5. In checking the ID function (Item 24), both manual switches S1 and S2 in the AR-2500R must be set to position 1 (ID). After checking the ID function, shift both switches back to position 2 (Data).

Item	Specifications	Check point/ adjuster	Measuring conditions
17 Self test	Shall be free of abnormalities.	Data recorder indicator	
18 Reproduced output in FAST mode	Reproduced output in both FAST FWD and FAST REV modes	BNC OUT	Record 1 kHz, 100% enough for confirmation at 19 cm/s, and check in FAST FWD and FAST REV modes.
19 Erase effect	-40 dB (Use 1 kHz BPF or spectrum analyzer.)	BNC OUT	Tape speed = 76 cm/s Recording level = 100% (1 kHz sine wave)
20 Reproduce head polarity	Recorded tape  Reproduced waveform (BNC OUT) 		Tape speed = 9.5 cm/s Reproduce polarity check tape.
21 Record/ head polarity	Recording signal (INPUT)  Reproduced waveform (BNC OUT) 		Tape speed = 9.5 cm/s Simultaneously record and reproduce.
22 Reproduced output in REV mode	FWD reproduce level ±1 dB	BNC OUT	Tape speed = 76 cm/s Recording signal = 150 kHz, 100% (sine wave) Separately reproduce (FWD, REV).

8. AR-250DR PRINTED CIRCUIT BOARD ASS'Y



Parts marked with an * require longer delivery time.

REF. NO.	PARTS NO.	DESCRIPTION	Q'TY	REMARKS
	15552686-00	PCBA	1	
	13352686-00	PCB	1	
	16787895-00	Card Plug	1	
		- IC's -		
U1 to 6	13447278	Linear, TL 072CP	6	
U9,21 to 23	13441434	MC 14053 BCP	4	
U20	13443145	MC 74HC4053N	1	
U8,10 to 13	13441441	MC 14051 B	5	
U19,23, 25	13441441	MC 14051 B	3	
U15,16	13442867	MC 74HC595N	2	
U17	13442558	MC 74HC368N	1	
U18	13442151	MC 74HC04N	1	
U14	15545025-00	PEAK HOLD PCBA	1	
		- Transistors -		
Q1,3, 6 to 12	13424134	2SC945-K	9	
Q14,15,17	13424134	2SC945-K	3	
Q2,4,13, 16	13421089	2SA733-K	4	
Q18 to 21	13428239	2SK68A-M	4	
		- Resistors -		
RA3,4	13493285	Array, 3-element 470k ohm	2	
RA1	13492337	Array, 4-element 470 ohm	1	
RA2	13492700	Array, 3-element 220k ohm	1	

Parts marked with an * require longer delivery time.

REF. NO.	PARTS NO.	DESCRIPTION	Q'TY	REMARKS
		- Resistors -		
R34,35, 38,39	11078104	RN 1/4W 100k ohm 0.5%	4	
R12,13, 28,40	11078103	RN 1/4W 10k ohm 0.5%	4	
R5 to 7, 10, 14 to 16	11078302	RN 1/4W 3k ohm 0.5%	7	
R11	11078123	RN 1/4W 12k ohm 0.5%	1	
R9	11078202	RN 1/4W 2k ohm 0.5%	1	
R8	11078102	RN 1/4W 1k ohm 0.5%	1	
R1	11078362	RN 1/4W 3.6k ohm 0.5%	1	
R4	11078242	RN 1/4W 2.4k ohm 0.5%	1	
R2,3,17	11078182	RN 1/4W 1.8k ohm 0.5%	3	
R24,25, 32,33	11078752	RN 1/4W 7.5k ohm 0.5%	4	
R30,31	11078751	RN 1/4W 750 ohm 0.5%	2	
R26,29	11078153	RN 1/4W 15k ohm 0.5%	2	
R27	11078303	RN 1/4W 30k ohm 0.5%	1	
R18	11078122	RN 1/4W 1.2k ohm 0.5%	1	
R19	11078152	RN 1/4W 1.5k ohm 0.5%	1	
R20	11078471	RN 1/4W 470 ohm 0.5%	1	
R21	11078431	RN 1/4W 430 ohm 0.5%	1	
R22,23	11078301	RN 1/4W 300 ohm 0.5%	2	
R36,37	11078393	RN 1/4W 39k ohm 0.5%	2	
R67,89, 90,113	11190101	RD 1/5W 100 ohm 5%	4	
R65,68, 78,92, 100 to 105	11190103	RD 1/5W 10k ohm 5%	10	
R41,42, 91,106, 107,109	11190104	RD 1/5W 100k ohm 5%	6	
R58	11190153	RD 1/5W 15k ohm 5%	1	
R49,50, 55,66,81, 87,88	11190302	RD 1/5W 3k ohm 5%	7	
R97 to 99	11190562	RD 1/5W 5.6k ohm 5%	3	

Parts marked with an * require longer delivery time.

REF. NO.	PARTS NO.	DESCRIPTION	Q'TY	REMARKS
		- Resistors -		
46	11190164	RD 1/5W 160 ohm 5%	1	
52	11190154	RD 1/5W 150 ohm 5%	1	
48,54	11190363	RD 1/5W 36k ohm 5%	2	
47,53, 50	11190364	RD 1/5W 360k ohm 5%	3	
93,94, 95,96	11190102	RD 1/5W 1k ohm 5%	4	
56,57	11190202	RD 1/2W 2k ohm 5%	2	
45	11190362	RD 1/5W 3.6k ohm 5%	1	
44	11190152	RD 1/5W 1.5k ohm 1%	1	
43	11190821	RD 1/5W 820 ohm 1%		
59,69	11190303	RD 1/5W 30k ohm 5%	2	
R79	11190225	RD 1/5W 2.2M ohm 5%	1	
R61	11190184	RD 1/5W 180k ohm 5%	1	
R62	11190913	RD 1/5W 91k ohm 5%	1	
R63	11190473	RD 1/5W 47k ohm 5%	1	
R64	11190243	RD 1/5W 24k ohm 5%	1	
R82,83	11190203	RD 1/5W 20k ohm 5%	2	
R84,85	11190100	RD 1/5W 10 ohm 5%	2	
R80	11190750	RD 1/5W 75 ohm 5%	1	
R86,108	11190474	RD 1/5W 470 ohm 5%	2	
R105	11190753	RD 1/5W 75k ohm 5%	1	
		- Variable Resistors -		
R70	13257190	500k ohm	1	
R71,72	13257189	200k ohm	2	
R73	13257188	100k ohm	1	
R74,111, 112	13257187	50k ohm	3	
R75	13257186	20k ohm	1	
R76	13257185	10k ohm	1	
R77	13257184	5k ohm	1	
R110	13257182	1k ohm	1	

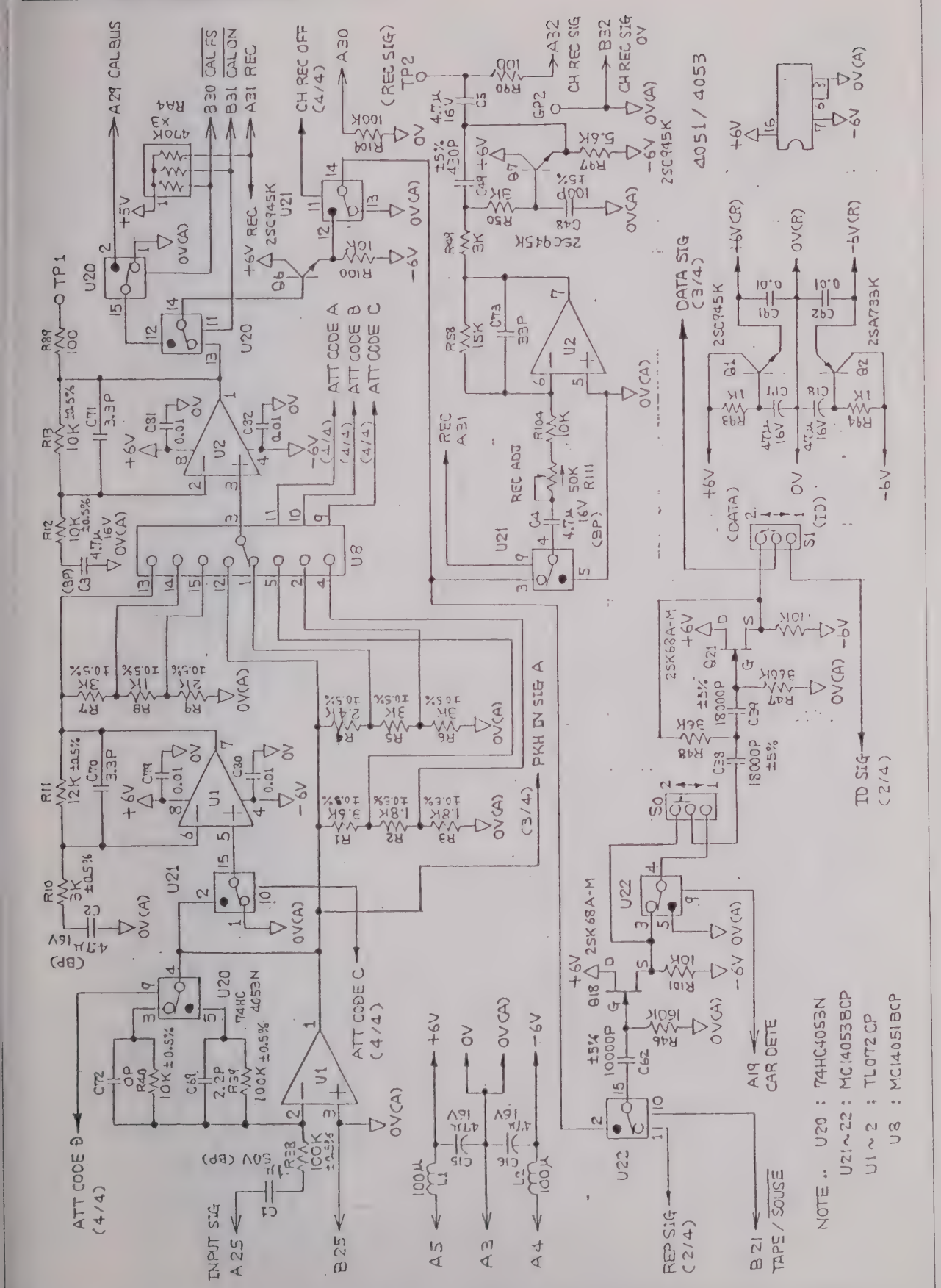
Parts marked with an * require longer delivery time.

REF. NO.	PARTS NO.	DESCRIPTION	Q'TY	REMARKS
		- Capacitors -		
C62,64, 52	12904041	CQ 50V 0.01MFJ	3	
C38,39, 58,59	12904044	CQ 50V 0.018MFJ	4	
C65	12904040	CQ 50V 0.0082MFJ	1	
C67	12904045	CQ 50V 0.0022MFJ	1	
C30	12904042	CQ 50V 0.012MFJ	1	
C31,41	12904039	CQ 50V 0.0068MFJ	2	
C32,42	12904035	CQ 50V 0.0033MFJ	2	
C33,43, 55	12904031	CQ 50V 0.0015MFJ	3	
C40	12904043	CQ 50V 0.0015MFJ	1	
C50	12904048	CQ 50V 0.0047MFJ	1	
C51	12904045	CQ 50V 0.022MFJ	1	
C53	12904037	CQ 50V 0.0047MFJ	1	
C54	12904034	CQ 50V 0.0027MFJ	1	
C60	12904030	CQ 50V 0.0012MFJ	1	
C37,48	12451101	CQ 100V 0.0001MF 5%	2	
C57	12451431	CQ 100V 0.00043MF 5%	1	
C66	12451432	CQ 100V 0.0043MF 5%	1	
C34,44, 56	12451751	CQ 100V 0.00075MF 5%	3	
C35,45	12451361	CQ 100V 0.00036MF 5%	2	
C36	12451181	CQ 100V 0.00018MF 5%	1	
C29,61	12451221	CQ 100V 0.00022MF 5%	2	
C46	12451121	CQ 100V 0.00012MF 5%	1	
C69	12900456	CC 100V 2.2PF ±0.25PF	1	
C70,71, 75	12900458	CC 100V 3.3PF ±0.25PF	3	
C79 to 102	12901330	CC 63V 0.01MF	24	
C73,47	12900470	CC 100V 33PF ±2%	2	
C74,76,77	12900466	CC 100V 15PF ±2%	3	
C68	12900464	CC 100V 10PF ±2%	1	
C63	12900476	CC 100V 100PF ±2%	1	

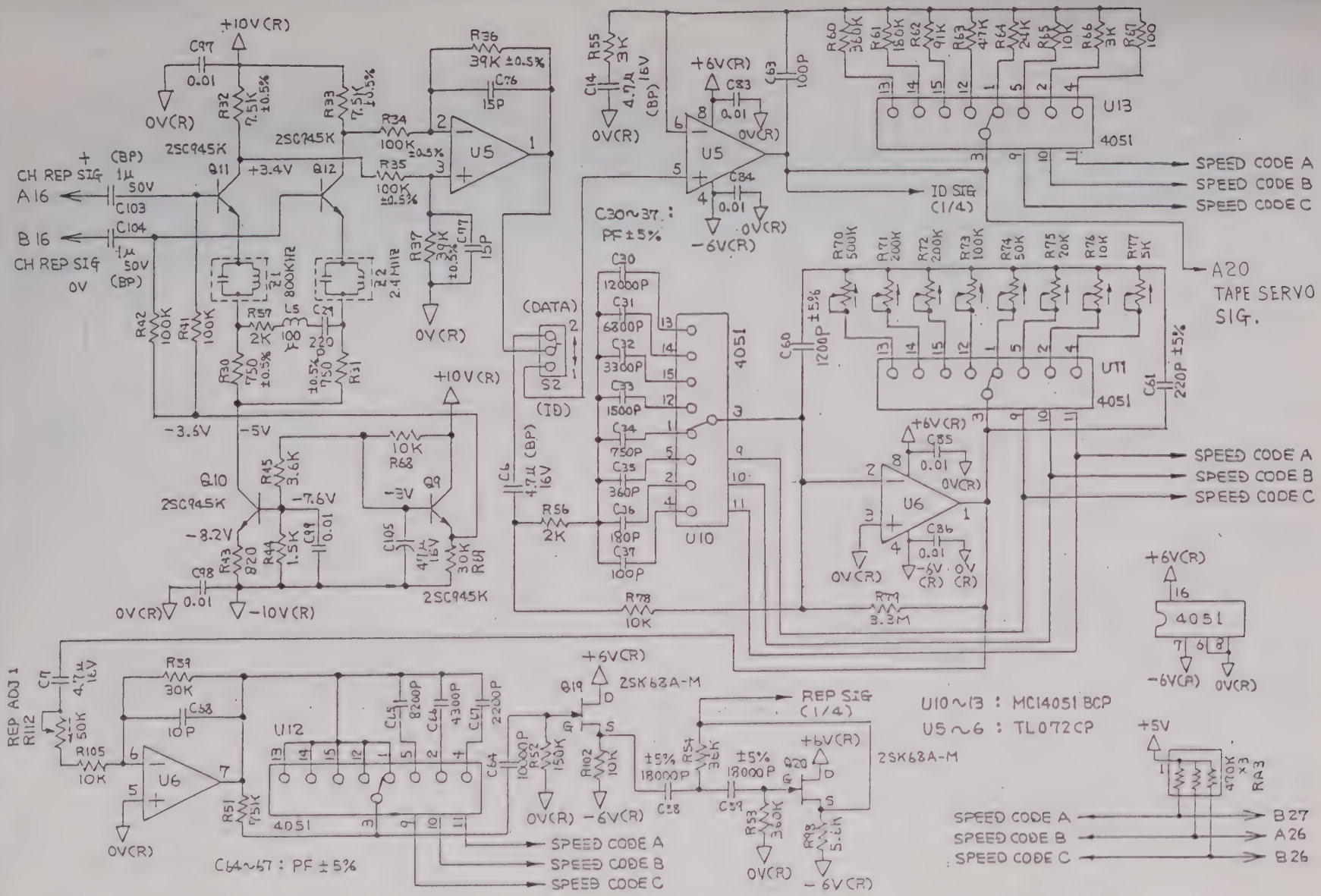
Parts marked with an * require longer delivery time.

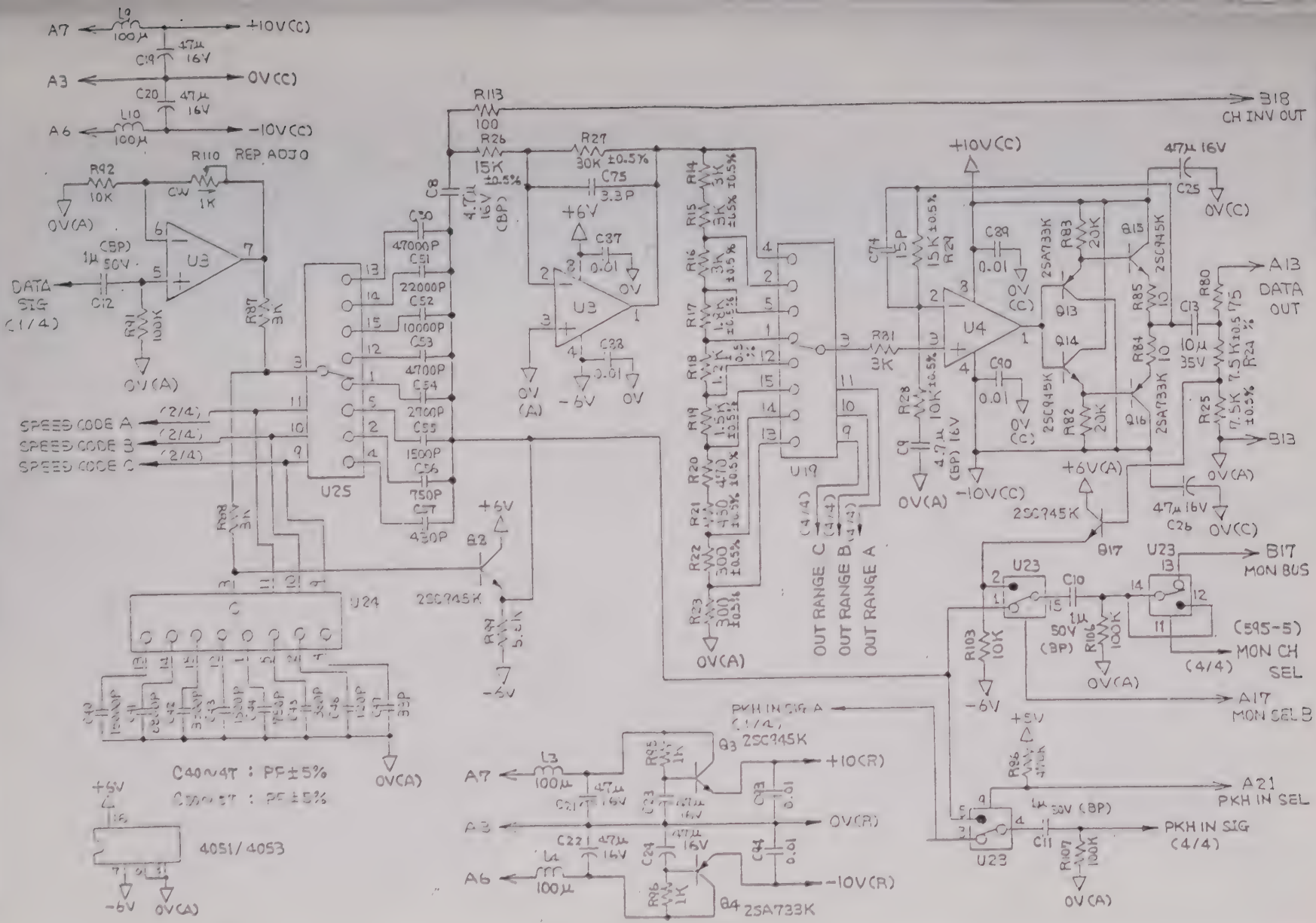
EF. NO.	PARTS NO.	DESCRIPTION	Q'TY	REMARKS
		- Capacitors -		
,10,11, ,103, 04	12904085	CE 50V 1MF ±20% BP	6	
2 to 9, 14	12904069	CE 16V 4.7MF ±20% BP	9	
13	12904070	CE 16V 10MF ±20% BP	1	
15 to 28 78,105	12902015	CE 16V 47MF	16	
1 to10	14723477	- Choke Coil - 100MFJ	10	
		- Bias Traps -		
2	14723512	2.4MHz	1	
1	13494043	800kHz	1	
1,2,GP2	13189150	- Terminal, Check -	3	
0,1,2	13224118	- Switch, Slide -	3	
	13123334	- Connector 64P -	1	

9. AR-250DR - Schematic Diagram - 1

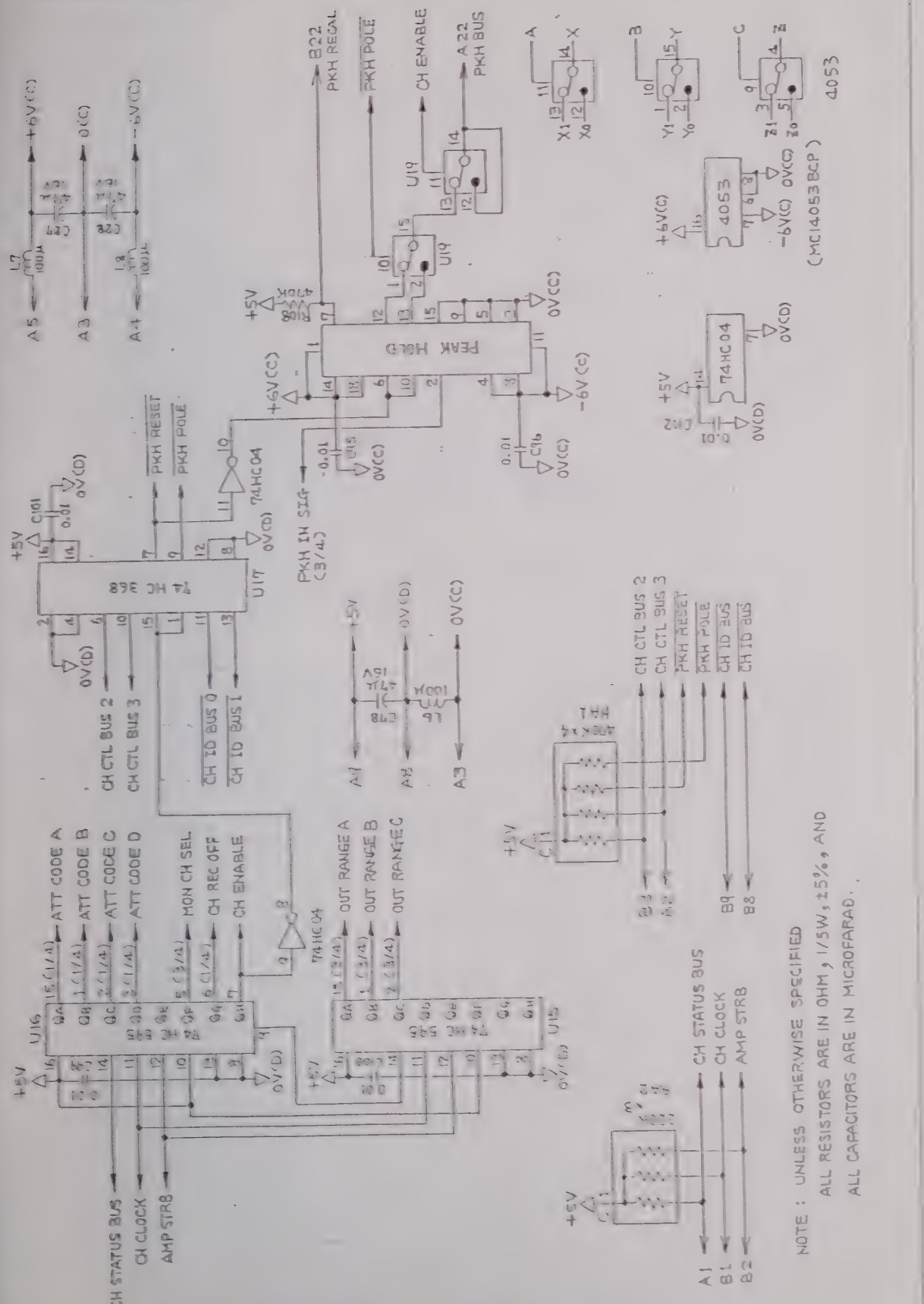


Schematic Diagram - 2




A7
A3
A6
+10V(C)
0V(C)
-10V(C)
REP ADJ
DATA SIG (1/4)
SPEED CODE A (2/4)
SPEED CODE B (2/4)
SPEED CODE C (2/4)
U25
U24
2SC945K
C40~47T : PF±5%
C50~57T : PF±5%
4051/4053
B18 CH INV OUT
A13 DATA OUT
B13
B17
B15
B16
B14
B2
B3
B4
2SA733K
OUT RANGE C
OUT RANGE B
OUT RANGE A
U19
U4
U23
B17 MON BUS
(595-5)
MON CH SEL
A17 MON SEL B
PKH IN SIG A (1/4)
A21 PKH IN SEL
PKH IN SIG (4/4)
+6V
-6V
+5V
0V(A)
0V(C)
0V(R)
-10V(R)

Schematic Diagram - 4



APPENDIX:

PARTS ORDERING INFORMATIONS

When ordering parts, always include the following information:

1. MODEL
2. UNIT SERIAL NO.
3. DESCRIPTION
4. REF. NO.

NOTICE REGARDING PARTS ORDERS

1. In some instances, indivisual minor parts are not available. In this case, the entire assembly, including the part requested, will be sent to you.
2. Do not order by only REF. No. or Description.
3. Parts marked with an * require longer delivery time, about two to three months.

NOTE:

–CAPACITORS–

CC = Ceramic, Magnetic capacitor.

CS = Tantalum.

CQ = Metallized film capacitor,
Film capacitor,
Metallized Polypropylene film.

CE = Aluminium electrolytic capacitor.

–RESISTORS–

RD = Carbon.

RN = Metal film.

VR = Variable resistor.

営業品目

- ディジタル磁気テープ記憶装置
- フロッピーディスクドライブ
- ハードディスクドライブ
- データレコーダ
- パーソナルコンピュータ
- ビデオレコーダ
- レーザービデオディスクプレーア
- 各種センサ
- 直流増幅器

TEAC CORPORATION
3-7-3, Naka-cho, Musashino,
Tokyo, Japan
Phone : (0422) 53-1111

TEAC CORPORATION OF AMERICA
7733 Telegraph Road, Montebello,
California 90640, U. S. A.
Phone : (213) 726-0303

ティアック株式会社

情報機器事業部　180・東京都武蔵野市中町３－７－３
営業部　電話 武蔵野（0422）５３－１１１１代
茨城営業所　300・土浦市東崎町１１－５
山本ビル・電話 土浦(0298)24－2865代
大阪営業所　564・吹田市垂水町３－34－10
電話 大阪（06）384－６０４１代
名古屋営業所　464・名古屋市千種区東山通り３－２－３
電話 名古屋（052）782－４５８１代
広島営業所　730・広島市中区西川口町13－19
電話 広島（082）294－４７５１代
福岡営業所　812・福岡市博多区東光２－２－24
電話 福岡（092）441－３６００代
仙台営業所　980・仙台市一番町２－５－５
中央ビル・電話 仙台(022)227－1501代
札幌営業所　064・札幌市中央区南７条西２－２
くぼたビル・電話札幌(011)521－4101代

村山工場　190-12・東京都武蔵村山市伊奈平2-11-1
電話 武蔵村山（0425）60－３２１１代
入間工場　358・埼玉県入間市小谷田８５７
電話 入間（0429）62－７１５１代